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Commissioner for Patents

The following is a corrected "Evidence Relied Upon" section from the Examiner's Answer mailed 4-21-2006:

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(8) Evidence Relied Upon
Whirlpool.com is contained in the following references:
Reference A: "KitchenAid Appliance Diagnostic System" archive.org website of whirlpool.com, 6/26/1997;
Reference B: "KitchenAid Repair Service Locator" archive.org website of whirlpool.com, 6/26/1997;
Reference E; Whirlpool website search engine, archive.org website of whirlpool.com 1/17/1999;
Reference F; Whirlpool webpage of air conditioners hypertext links of specific models, archive.org website of 4/29/1999.
Reference G; Whirlpool webpage "Service Matters", archive.org website of 6/26/1997.

PointServe is contained in the following references:
Hickey, Kathleen, "Right Place, Right Time", Nov 1999, Traffic World, v260, n4, p47, Dialog 06791905 57430340, hereafter referred to as Reference U1.
PRNewswire, "PointServe Launches Breakthrough On-Line Scheduling Solutions to Dramatically Improve the Reliability of Home and Business-Oriented Service Delivery Regional Rollout to Begin in Salt Lake City on Nov 1; National Launch Slated for Early 2000", Oct 1999, p.1, ProQuest ID 45806204, hereafter referred to as Reference V1.
Satran, Dick, "Rocket Scientist tries improving service industry", Oct 1999, Vancouver Sun, Vancouver, B.C., p.E2, ProQuest ID 08321299, hereafter referred to as Reference W1.
Hall, John, R; "New Service Website Holds Promise for Contractors", Nov 1999, Air Conditioning, Heating & Refrigeration News; 208, 13; ABI/INFORM Global, p.1, hereafter referred to as Reference X1.

Francett is contained in the following reference:
Francett, Barbara, "An Exercise in Utility", June 1997, Software Magazine; 17, 6; hereinafter referred to as Reference U2. ABI/INFORM Global, p.75,

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A copy of the Francett reference is attached to this communication

Romain Jeanty
Primary Examiner
Art Unit 3623

An exercise in utility - Public Service Electric & Gas, Boston Edison and National Fuel Gas Distribution using new applications to provide better field service calls - includes related article on implementing automated field service applications - Company Operations

Barbara Francett

Huge public utilities like Public Service Electric & Gas Co., National Fuel Gas Distribution Corp. and Boston Edison share a major problem: how to deliver timely field service to customers needing repairs. Up until recently, field service has been a manual process awash in paperwork. Now, these savvy utilities are taking advantage of custom apps that tie their road warriors directly to centralized corporate databases.In this era of automation, field service remains characterized by manual procedures and mounds of paperwork, much to the dismay of service providers and their customers. Just ask anyone who's had to take a day off from work to wait for a utility company serviceperson because the "arrival time" window spanned some eight hours.

If ever an activity could benefit from information technology, this is it: The payoffs that come from linking remote field service personnel to centralized databases to improve service can be considerable. It's been a long time coming, as the wheels of bureaucracy in organizations such as highly regulated public utilities turn slowly. Nevertheless, imminent deregulation has lit a flame under farsighted utilities, which recognize a business opportunity when they see one.

"We knew deregulation was coming, and we had to position ourselves," says Lou Kaufer, senior IT business partner at Public Service Electric & Gas Co. (PSE&G) in Newark, N.J. "This meant we had to bring significant technology to the business."

According to Kaufer, one of the first new opportunities PSE&G identified to increase revenue was to go beyond their gas service business on hot water heaters and furnaces by offering service contracts on additional appliances, such as clothes dryers and air conditioners, much as big appliance retailers do. In order to take advantage of that opportunity, however, PSE&G needed to improve its approach to service dispatching and work management. "Because labor is our biggest cost, anything that improves labor productivity improves efficiency," Kaufer says.

PSE&G serves a swath of New Jersey that extends from New York City to Philadelphia and comprises 75% of the state's population and all the major industrial areas. Before the new Gas Service Information Management System (GSIMS) was implemented, 800 servicepeople were dispatched from 12 districts to handle service calls -- activating or deactivating gas and electric service, investigating reports of gas leaks and lack of heat, and so on.

"Each serviceperson had their own vehicle and work zone," Kaufer says. "Every day they would get a stack of printed work tickets. Contact with the dispatch station was through radio phone calls. They'd have to fill out work orders and record service times. It was manually intensive -- the routes could be inefficient and the air waves could be busy." The GSIMS, developed with Cambridge, Mass.-based systems developer Sapient Corp., automates the whole process. "This application was driven by PSE&G's business requirement for a realtime connection to dispatch operations and realtime access to the field. PSE&G wanted to shrink the scheduling parameter to two hours," says Chris Davey, Sapient's vice president of sales. "This means extreme connectivity." What differentiates field service applications from sales force automation projects is the critical nature of the information being sent back and forth, Davey adds. "The robustness of the network must be heightened."

The GSIMS system uses public Cellular Digital Packet Data wireless technology from Bell Atlantic Nynex Mobile to transmit data from dispatchers to the service vehicles. Now PSE&G servicepeople get their work orders electronically, based on appointment locations and chronology, as well as a customer history.

Sapient added a middleware component from Minneapolis-based Racotek that sends and receives transactions between the central Oracle database and the field units, manages traffic from the server to field clients, and monitors the status of the connection. Sapient also built software that compresses data packets, thus reducing the number of packets sent, as well as synchronization and mapping software for the application's diverse database components.

Aboard each service vehicle is a Pentium 586 pen-based laptop with an extended keyboard running a Watcom remote database. Touching the laptop's light pen to the screen brings up work order details, such as the type and brand of appliances a customer has, to ensure that the serviceperson brings the correct parts;

whether the customer owns a dog; and so on. Another touch with the pen to the electronic work order sends a signal to the dispatcher that the serviceperson is "on the way." When that job is done, the service-person brings up an electronic comple- tion screen on the laptop, which automatically creates a time sheet. The next order appears as well. Meanwhile, work management screens allow the dispatchers to view where all the service- people in their districts are, and what orders they are working on. GSIMS, which was rolled out between April and November of last year, has increased productivity by two orders per serviceperson per day, Kaufer says. PSE&G has also been able to consolidate its 12 dispatch districts into four, saving overhead costs.

Moreover, since they no longer have to return to the districts to fill out time sheets, servicepeople can take their vehicles straight home after finishing their last job of the day. Likewise, because they don't have to report to the district in the morning to collect printed work tickets, they can go directly from home to the first order of the day. "This increases 'wrench time' -- customer premise time," Kaufer notes.

The system expedites material distribution as well.

Before, servicepeople had to drive back to their districts to get parts. "Now they can go to a drop box near where they live or we FedEx the parts to their homes," Kaufer says. "When a part is used, that information goes back to the inventory system, which flags the distribution system, which sends the serviceperson a replacement."

For the future, Kaufer says, "the infrastructure offers a lot of opportunities, but none are firmed up yet." Some possibilities include a tighter link with materials management; inventory checks on adjacent service vehicles; putting CD-ROMs on the vehicles with technical manuals, maps, or wiring schematics; and creating bills for service at the customer location.

The key to attaining the "extreme connectivity" that automated field service applications require is to assemble existing technology in different ways, according to Pat Boyle, manager of planning and technology at National Fuel Gas Distribution Corp. (NFGDC), Buffalo, N.Y. National Fuel serves a 5,000-square-mile territory in northern New York.

Like PSE&G, National Fuel needed an alternative to radio frequency (RF) communications for its field service operations. "Things happen with RF," Boyle says. "We have low mountains and brownouts. We looked at cellular technology, but it didn't improve the spottiness." NFGDC bit the bullet and opted for satellite technology, despite the expense, for its Work Order Integration Project. Satellite communications connect PCs running DB2 for OS/2 in 10 dispatchers' offices to call center data on the Adabas/D mainframe database in Buffalo.

The mainframe forwards call center data to a communications controller, which communicates via satellite to the dispatchers' PCs and then to the portable PCs in the utility's 260 service vehicles. A color code scheme on the dispatchers' screens displays service vehicle status -- green identifies an available truck, red indicates a truck en route to an emergency, and black means a truck is out of service.

Entire Broker APPC middleware, from Software AG, Reston, Va., provides translation and mapping of the mainframe and PC data. According to Boyle, 6,000 to 7,000 transactions, making up several thousand orders, pass back and forth between the mainframe and the PCs every day. At NFGDC, field servicepeople return to docking centers at the end of the workday to download their portable PC data.

The Work Order Integration Project's principal benefit, Boyle says, is that "it allows us to generalize the workforce. We can bundle orders and servicepeople together either geographically or by skill set. The system makes objective decisions." It also provides the opportunity to outsource services to third-party contractors. "They could just dial in," Boyle says. NFGDC next plans to extend the system to meter maintenance tasks and the inspection of some 80,000 valves on the utility's gas lines.

For its part, Boston Edison Co., a utility that provides a billion dollars' worth of electricity and services to 1,000 commercial customers comprising some 34,000 accounts, uses its sales force automation system as a means to coordinate and administer its field service activities.

"We spend 75% of our time servicing customers," says Brian Balcom, sales manager for the utility's 25-member sales force. "Our largest customer, for example, is a $20 million purchaser of electricity. We need to see everything all in one place." Boston Edison uses CallBack software from Abend Associates Inc.,

Burlington, Mass., to track the entire cus- tomer experience from opportunity to service. CallBack is linked to Boston Edison's data warehouse, through both network desktop machines and remote laptops for field work. The utility uses Oracle as its central database, but the remote version of CallBack uses Sybase's SQL Anywhere remote database. The network and remote versions talk to each other through a data exchange process that occurs when the laptops are docked at the desktops. The utility views the system as critical to its strategy for deregulation. "When I came here two and a half years ago from a private utility, there were only pockets of customer information available," Balcom says. "When deregulation comes, we'll be dependent on product markets. If we don't collect data now, we'll be stabbing in the dark." Balcom estimates that his sales force is out of the office half the time on service-related customer calls. "We then coordinate with the service providers, such as metering installers. We are the service administrators. We've gone from fragmented service to a single point of contact for handling questions from all service areas," he says. Organizations like these utilities will continue to search for innovative approaches to applying infor- mation technology to their field service operations. The Internet, for instance, adds a new twist to mobile solutions, according to Chuck Lownie, product manager of the workplace database division at Sybase Inc., Emeryville, Calif.

"Making [field service] applications available directly over the Internet is ideal for passing on volumes of information [to remote users]," Lownie says. To that end, Sybase offers SQL Anywhere Professional for Web developers and database administra- tors. The Professional edition includes NetImpact Dynamo, a tool for building Web sites, as well as InfoMaker, a Powersoft query and reporting tool.

Dynamo provides access to the SQL Anywhere database over the Web. Its template technology lets users create templates that embed SQL scripts into HTML files. The combination of Dynamo and SQL Anywhere lets users store Web site content and templates directly on the database, where they can take advantage of automated backup and recovery and replication features. The next wave of remote solutions will likely feature an artificial intelligence component, predicts Harold Gubnitsky, director of the collaborative computing group at Cambridge Technology Partners, a Cambridge, Mass.-based consultancy that designs and implements remote applications. This component, combined with advances in data navigation and extraction, will "seek through multiple sources of information," he says.

Such advances will doubtless be more than welcome. "We expect deregulation by next April," says Boston Edison's Balcom. "Our customers will have a choice, and we could lose up to one-third of our revenues. If we're going to take a good run at it, we need information."

Service is key to that strategy. "You have to provide service to keep customers," Balcom says.

Related Article: Advice from the field Developing and implementing automated field service applications is arduous work. Beyond the complex information technology involved are a number of "people issues" that are essential to a successful application. Here, the pros offer some tips:

* Mandate user involvement, recommends Chris Davey, vice president of sales at Sapient Corp., Cambridge, Mass. "Develop cross-functional ownership and commitment," he says. "At Public Service Electric & Gas Co., end users actually designed the applications. This creates end-user buy-in and accountability." According to Davey, this helps end users effectively manage their expectations and communicate the benefits of the applica- tions to their peers in the organization. "Otherwise, the conception can be one of 'Big Brother is watching me' rather than 'This application is making me more effective in my job.'"

* Identify training and simulation components, says Harold Gubnitsky of Cambridge Technology Partners, Cambridge, Mass. "It's important to make sure the technology -- laptops, databases, etc. -- is easy to use." * To that end, make sure end users can get at strategic information easily, Gubnitsky says. "Use human interfaces, not keywords. GUIs must be intuitive. Users must be able to easily search and navigate information."

* Finally, Gubnitsky says, design the application so all data is easily accessible regardless of source, be it a data warehouse, the Internet or various workgroups. "A query should be able to go across all technology systems seamlessly," he says.